Use of Existing Sampling Sites for Event Sampling

Denka Performance Elastomers

Evaluate Existing Site Suitability

- Location of Sites
  - Proximity to high impacting source (Poly Building)
  - Direction relative to frequency of low wind speeds
  - Alignment of DPE sources
- Analysis of Concentrations Post-Control
  - Observed
    - Quarterly averages
    - Maximum measured
    - Variability
  - Modeled
   - 1-hour concentrations vs distance

Site and Sampling Map

- Yellow markers (7) EPA sites
  - 1 is for meteorological site
- Red markers (6) industry sites
  - 1 site off map across river
- Two sites near collocated
  - Hospital
  - Levee
- EPA sampling – every 3rd day
- Industry sampling – variable
  - Every 4th or 5th day
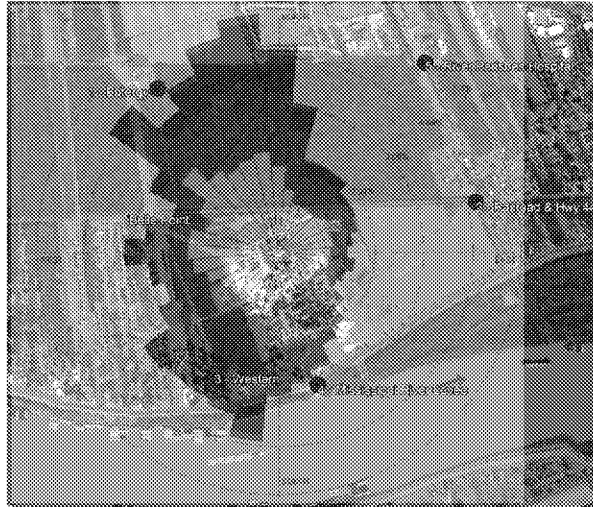- Denka marker at current-day largest emission point

- Flow Vectors (direction of flows)
- New Orleans Airport (2011-2015)

- Lowest speeds (0.5 – 2.1) m/s are of most concern.
- Highest low-wind frequencies are toward W to NNW and toward E
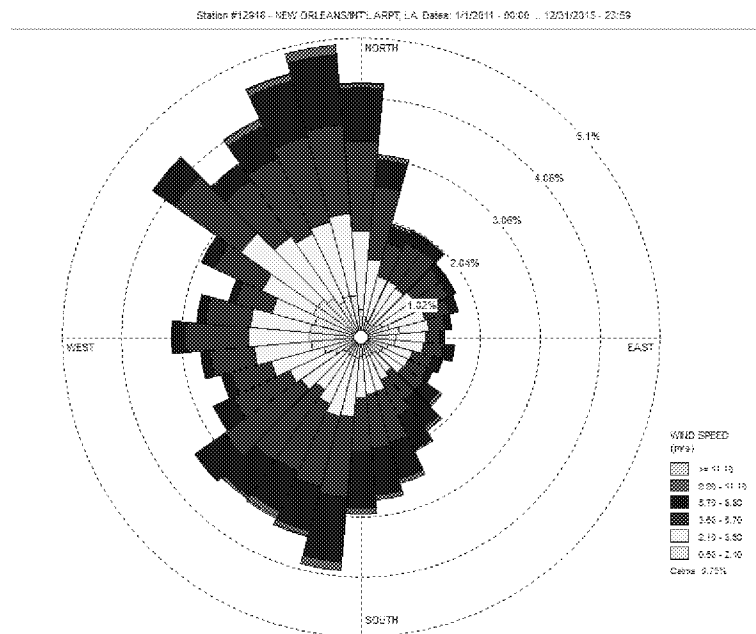
# Locations of Denka Monitoring Network Sites Relative to Flow Vectors

Proximity to Poly Building

| Location	Distance (km)	Angle	Network
1 - Entergy	1.33	140	Denka
2 - Railroad	2.25	290	Denka
3 – Western	0.93	30	Denka
4 - Levee	0.89	340	Denka
5 - Hospital	1.57	220	Denka
6 - Edgard	3.62	60	Denka
Acorn and Hwy 44	1.47	270	EPA
238 Chad Baker*	0.88	70	EPA
East Saint John High School	2.11	160	EPA
Fifth Ward Elementary School	1.1	40	EPA
Levee	0.9	350	EPA
Ochsner Hospital	1.57	210	EPA

* EPA site, Chad Baker, is close to source and in direction of frequent low wind speeds

Post-Control Max 24-Hr Concentration vs Distance (Red= EPA Site)
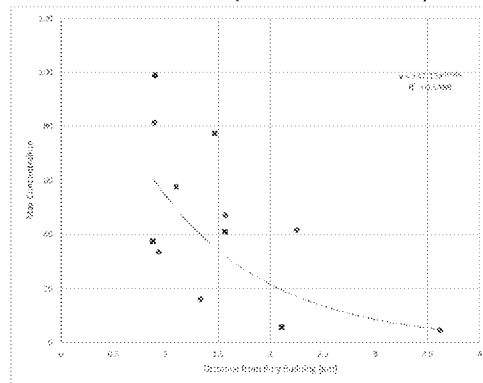
As you get further from the source not only do concentrations decrease but the angle subtended by the facility gets narrower – thus sources are harder to distinguish by WD analysis.

Modeled Maximum 1-Hour CD Concentration (μg/m3) vs Distance from Poly Building (km), with Routine Emissions
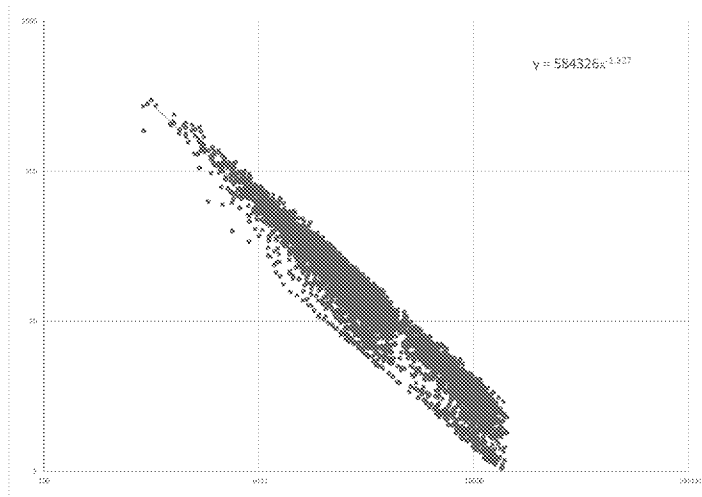

Based on analysis of the frequency distribution of observed data, the 24-hr average concentrations during periods with an upset at the plant may be 5X the routine concentrations.

Depending on the length of the upsets previously observed, the 1-hour concentrations during an upset at the plant could be much greater than 5X the routine 1-hour levels.
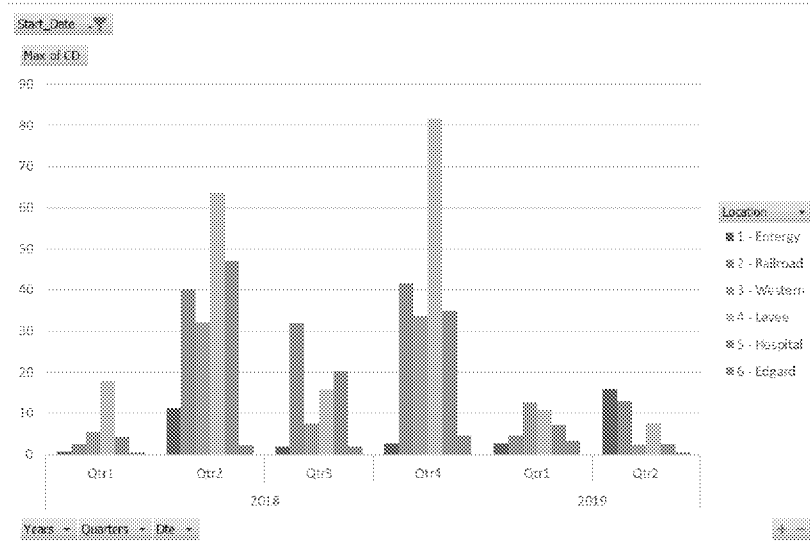
Post-Control Average 24-Hr Concentrations By Site & Quarter*

Stacked Area Graph
shows each site's
contribution to total
network concentrations
by quarter
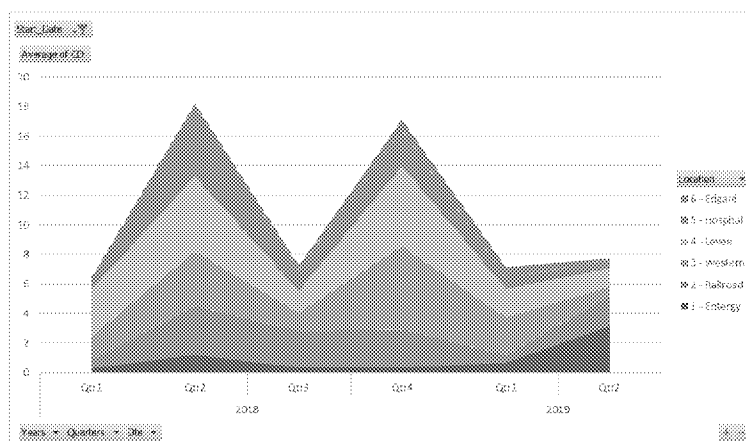
* Q1 2018 only March; Q2 2019 only April. To calculate average, BDL concentrations assigned value of 0.05 µg/m3

Highest 24-Hr Concentrations by Site and Quarter*

* Q1 2018 only March; Q2 2019 only April

Variability of Chloroprene Concentrations Post-control

Site	Max	90th Percentile	Average*	Max/Avg	90th/Avg	Max/90th	Percent of obs BDL
Entergy	16	2.4	0.83	19.19	2.88	6.67	56
Railroad	41.6	3.3	2.13	19.56	1.55	12.61	60
Western	33.6	8.2	3.05	11.00	2.68	4.10	46
Levee	81.5	9	3.34	24.43	2.70	9.06	46
Hospital	47.1	3.9	2.15	21.87	1.81	12.08	61
Edgard	4.5	1.7	0.41	10.93	4.13	2.65	72

*BDL concentrations set to 0.05 µg/m3 for averaging

- 90th Percentile concentration was found to be the point at which the observed distribution departs from what is expected compared to the modeled distribution.
- Departure may be attributable to non-routine emissions
- Investigation threshold should be at or above 90th percentile concentration
- Current threshold is 15 µg/m3 which is much greater than 90th percentile at any site.

Alignment of Sources

Modeled Isopleths for Max 1-hour average concentrations with routine emissions.
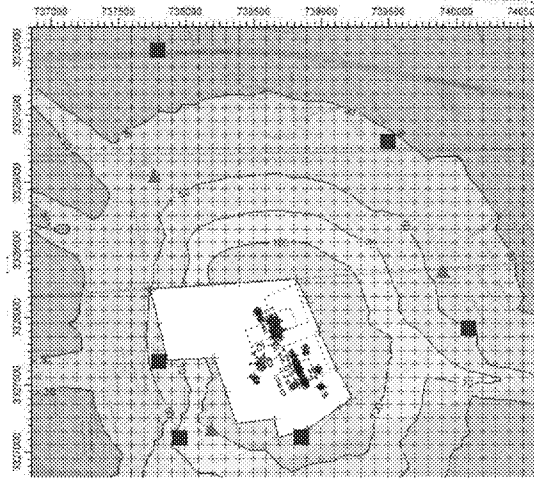
- Highest modeled concentrations occur near the plant boundary.
- South placement good for measuring high concentrations, but poor for distinguishing which source(s) may be contributing to an event
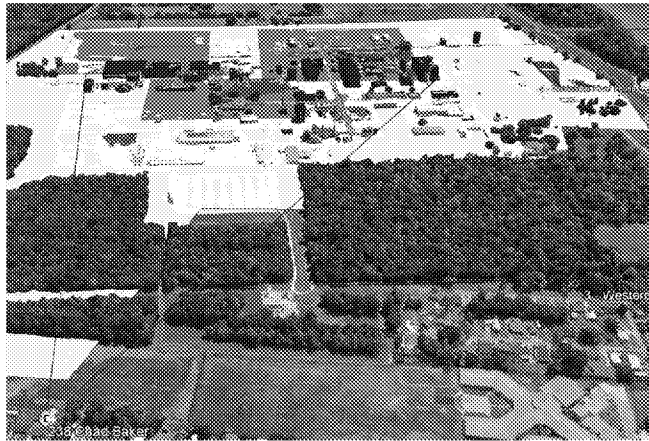- Placement to east and west best for distinguishing sources

Western

CW: 22°, 965m
CCW: 65°, 660m
Δ angle: 43°
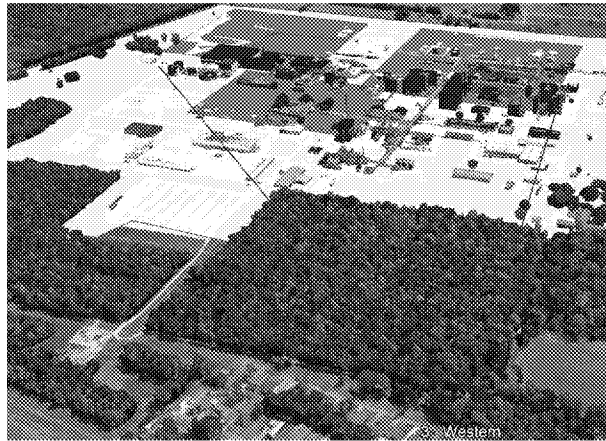
Chad Baker

CW: 103°, 975m
CCW: 64°, 900m
Δ angle: 39°

Railroad

CW: 239°, 1300m
CCW: 251°, 1320m
Δ angle: 12°

Acorn and Highway 44

CW: 252°, 1300m
CCW: 278°, 1465m
Δ angle: 26°

Summary

- Priority Order of Sites

High Probability of Detecting Events	Best for Distinguishing Individual Sources
Levee	Western
Chad Baker (EPA)	Chad Baker (EPA)
Western	Railroad
Hospital	Hospital
Railroad	Levee
Entergy	Entergy
Edgard	Edgard